

3 PLANNED REMEDIAL ACTION

To meet the objectives described in Section 1, the planned remedial action consists of: 1) excavating the dinoseb-impacted soil that is in contact with the shallow groundwater beneath the former wash pad area, 2) installing and maintaining asphalt surface caps over the impacted soil at the 21-0-0-7 fertilizer spill area, the former gasoline UST area, the former helicopter spray office building area, and the former helicopter pad area, 3) installing two groundwater monitoring wells to the west of the site to monitor the off-site shallow groundwater conditions, 4) conducting groundwater sampling events to monitor the natural attenuation of the dinoseb- and nitrate-impacted groundwater, and 5) implementing institutional controls to limit the exposure and risks associated with the remaining impacted soil and groundwater beneath the site.

This section describes the scope of work for the remedial action. Detailed procedures for sampling and analysis, and quality assurance are presented in a Sampling and Analysis Plan (Appendix A). The health and safety procedures associated with the remedial action are presented in a Health and Safety Plan (Appendix B).

3.1 Excavate Dinoseb-Impacted Soil – Former Wash Pad Area

Based on the results of the previous investigations, the dinoseb-impacted soil that is in contact with the shallow groundwater beneath the former wash pad is the source of the dinoseb-impacted groundwater at the site. The estimated area of the impacted soil that is in contact with the groundwater is approximately 1,400 square feet (Figure 5). The area of impacted soil appears to extend a few feet beyond the northern boundary of the site, on to Franklin County property. The zone of groundwater fluctuation beneath the former wash pad area occurs at a depth of approximately 25 to 29 feet below ground surface (bgs).

The on-site dinoseb-impacted soil that is in contact with the groundwater will be removed by excavation methods. Prior to excavation, the overhead and underground utility lines (electrical and telephone) that are located in the area of excavation will be temporarily relocated. All of the underground utilities within 50 feet of the planned excavation area will be located and marked by using a private utility locating company.

To prevent the soil excavation from extending onto the neighboring Franklin County property, steel sheet piling will be installed along the northern property line and along the

western and eastern extents of excavation. Sheet piling may also be installed along the southern extent of the excavation or the sidewall may be sloped to prevent caving. The location and depth of the sheet piling will be determined by the selected excavation contractor, in accordance with OSHA regulations. The minimum area of the excavation is shown on Figure 5.

A minimum of approximately 3,000 cubic yards of impacted and “clean” soil will be removed from the excavation. The soil excavated at depths between 25 and 29 feet bgs (approximately 250 cubic yards) will be hauled to the Regional Disposal Company Landfill in Roosevelt, Washington, for disposal as a non-hazardous waste. The soil excavated at depths of less than 25 feet bgs will be temporarily stockpiled on site. After completing the excavation, a soil sample will be collected from each of the sidewalls that do not consist of sheet piling, at a depth of approximately 25 feet bgs. The soil samples will be submitted to North Creek Analytical, Inc. (NCA), in Bothell, Washington, for analysis of chlorinated herbicides by EPA Method 8151A.

If the soil samples contain dinoseb concentrations below the site cleanup level (130 micrograms per kilogram), then the excavation will be backfilled. If any soil sample contains a dinoseb concentration above the site cleanup level, then the sidewall where the sample was collected will be extended another 5 feet and re-sampled.

Clean imported material will be used to backfill the excavation at depths within the zone of groundwater fluctuation. After backfilling the imported material and placing a geotextile fabric over the material, the stockpiled soil will be used to backfill the excavation to ground surface. After completing the backfilling, the sheetpiling will be removed and the excavation area will be covered with a 3-inch-thick asphalt cap to prevent direct contact with the impacted backfilled soil and to eliminate the infiltration of storm water through the impacted soil (protect the groundwater). An Engineering Design Report (EDR) that provides the design specifications for the work is presented in Appendix C. An Operation and Maintenance Plan that provides the specifications for inspection and maintenance of the asphalt cap is presented in Appendix D.

3.2 Install Asphalt Caps

Impacted soils at the 21-0-0-7 fertilizer spill area, the former gasoline UST area, the former helicopter spray office building, the former helicopter pad area, and the former open-top tank area occur at depths above the zone of groundwater fluctuation and are not sources of the impacted groundwater. These areas of impacted soil are shown on Figures 6, 7, and 8. To prevent direct contact with the shallow impacted soil and eliminate storm water infiltration through the impacted soil, the ground surface above each impacted soil area, except at the former open-top tank area, will be covered with a 3-inch-thick asphalt cap. The area of impacted soil in the vicinity of the former open-top tank is currently

located beneath the concrete floor of a warehouse; therefore, a surface cap is already in place (Figure 8). The paving specifications are detailed in the EDR (Appendix C) and the inspection and maintenance procedures are detailed in the Operation and Maintenance Plan (Appendix D). After the installation of the caps, a deed restriction will be implemented that restricts the disturbance of the caps and the excavation of the impacted soil beneath the caps.

To verify the effectiveness of the caps, groundwater samples will be collected on an annual basis from on-site shallow groundwater monitoring wells MW-4 and MW-14 for a period of at least five years. MW-4 and MW-14 are located along the western boundary of the site (Figure 2). The groundwater samples will be submitted to NCA for analysis of chlorinated herbicides. When the dinoseb concentrations in the samples are below the site cleanup level for two consecutive annual events, then the annual monitoring will be discontinued.

3.3 Monitor Natural Attenuation of Impacted Groundwater

Based on the results of the previous investigations, dinoseb-impacted shallow groundwater that contains concentrations greater than the site cleanup level (7 micrograms per liter) occurs beneath the former wash pad area and extends to the west-southwest, beyond the western boundary of the site (Figure 4). Nitrate-impacted shallow groundwater that contains concentrations greater than the site cleanup level (17.7 milligrams per liter) occurs beneath the northeastern part of the site and extends to the west-southwest, beyond the western boundary of the site (Figure 4). The remedial action for the impacted groundwater will consist of monitoring the natural attenuation of the dinoseb and nitrate concentrations. The dinoseb concentrations are expected to decrease rapidly following the excavation of the impacted soil from the zone of groundwater fluctuation beneath the former wash pad area. After completing the soil excavation activities, a deed restriction will be implemented that prevents the use of the shallow impacted groundwater beneath the site for drinking water purposes.

To allow for monitoring of the off-site shallow groundwater, two groundwater monitoring wells (designated MW-16 and MW-17) will be installed to the west of the site (Figure 4). MW-16 will be located on the property of Mr. Glen Roundy, approximately 400 feet to the southwest (hydraulically downgradient) of the estimated downgradient extent of dinoseb-impacted groundwater. MW-17 will be located on Franklin County property, approximately 60 feet southwest of the downgradient extent of the nitrate-impacted groundwater. Prior to conducting the well installation, WFS will obtain permits from Mr. Roundy and Franklin County to install the wells on their properties. All of the underground utilities within 50 feet of the planned well locations will be located and marked by using a private utility locating company.

During drilling, soil samples will be collected at 5-foot intervals by using a split-spoon sampler. A soil sample collected from each boring, at a depth of less than 5 feet above the groundwater table, will be submitted to NCA for analysis. The samples will be analyzed for nitrate by EPA Method 300.0 and for chlorinated herbicides. Both borings will be completed to depths of approximately 5 feet below the shallow groundwater table (approximately 25 to 30 feet bgs). The wells will be constructed similar to the existing shallow monitoring wells at the site and the well screens will straddle the groundwater table. After installation, a licensed surveyor will survey the locations and top of casing elevations of the new wells.

To monitor the natural attenuation of the dinoseb- and nitrate-impacted shallow groundwater beneath the site and to the west of the site, groundwater samples will be collected from selected wells on a semi-annual to quarterly basis. Prior to each groundwater sampling event, the depths to groundwater will be measured in all of the on-site and off-site shallow groundwater monitoring wells. To monitor the attenuation of the dinoseb-impacted groundwater, groundwater samples will be collected from on-site wells MW-3 and MW-8 and off-site well MW-16 on a semi-annual basis. The samples will be submitted to NCA for analysis of chlorinated herbicides. When the dinoseb concentrations in the groundwater samples from the on-site compliance point (MW-8) are below the site cleanup level for two consecutive semi-annual sampling events, groundwater samples will be collected from MW-3, MW-8, and MW-16 on a quarterly basis for a period of at least one year. If the dinoseb concentrations in the quarterly samples from on-site compliance point MW-8 are below the cleanup level for four consecutive sampling events, then the groundwater monitoring for dinoseb will be discontinued.

To monitor the attenuation of the nitrate-impacted groundwater, groundwater samples will be collected from on-site wells MW-4 and MW-14 and off-site wells MW-16 and MW-17 on a semi-annual basis. The samples will be submitted to NCA for analysis of nitrate. When the nitrate concentrations in the groundwater samples from the two on-site compliance points (MW-4 and MW-14) are below the site cleanup level for two consecutive semi-annual sampling events, groundwater samples will be collected from MW-4, MW-14, MW-16, and MW-17 on a quarterly basis for a period of at least one year. If the nitrate concentrations in the quarterly samples from the two on-site compliance points are below the cleanup level for four consecutive sampling events, then the groundwater monitoring for nitrate will be discontinued.